

Amendments to the Claims

The following includes the entire set of pending claims with mark-ups.

Please amend Claim 14.

1. (previously presented) An apparatus for imaging, comprising:
a light source emitting a polarized light beam;
an optical assembly including a top surface and a bottom surface, wherein (a) the bottom surface includes first and second grating portions positioned such that the light beam passes through the first grating portion, reflects at the top surface to provide an evanescent field adjacent the top surface, and exits the optical assembly through the second grating portion, and (b) the optical assembly accommodates positioning a specimen array within the evanescent field, such that the specimen array causes spatially distributed polarization changes in the cross-section of the light beam; and
a two-dimensional array detector positioned to detect the spatially distributed polarization changes in the light beam to provide an image of the specimen array.
2. (previously presented) The apparatus of claim 1, wherein said first and second gratings comprise Bragg gratings.
3. (previously presented) The apparatus of claim 1, wherein said first and second gratings comprise electrically alterable gratings, said apparatus also including means for altering said first and second gratings in a manner to change the direction of light incident thereto.
4. (previously presented) The apparatus of claim 3, wherein said first and second gratings comprise electrically alterable holograms.
5. (previously presented) The apparatus of claim 1, further comprising a wavelength filter for selecting the wavelength of light from said light source assembly.
6. (previously presented) The apparatus of claim 1, further comprising an arcuate adjusting mechanism for moving said light source assembly about an arcuate path to selected positions therealong to alter the angle of the light beam into the optical assembly.

7. (previously presented) The apparatus of claim 1, further comprising a flow cell secured to said top surface, said flow cell including an inlet port and an outlet port for flowing analyte across said top surface.
8. (previously presented) The apparatus of claim 1, further comprising a computer, said computer including means for converting images from said reflected light into analytical data.
9. (previously presented) The apparatus of claim 5, wherein said wavelength filter comprises a filter wheel located to intercept light from said light source assembly, said apparatus including means for rotating said wheel.
10. (previously presented) The apparatus of claim 5, wherein said wavelength filter comprises a stack filter.
11. (previously presented) The apparatus of claim 3, further comprising a plurality of imagers, each of said imagers being located at a position to capture an image generated in response to input light at a corresponding angle of incidence.
12. (previously presented) The apparatus of claim 5, further comprising a plurality of imagers, each of said imagers being located at a position to capture an image generated in response to input light of a corresponding wavelength.
13. (previously presented) The apparatus of claim 7, wherein said flow cell includes means for securing a slide thereto.
14. (currently amended) A cassette for use with an imaging apparatus, ~~said imaging apparatus including a light source providing a polarized light beam, and a two-dimensional array detector adapted for providing an image based on spatially distributed polarization changes in the light beam,~~ said cassette comprising:
 - an optical element comprising a reflective surface to allow formation thereon of a specimen array, said optical element being configured to direct [[the]] a polarized light beam from a light source to the reflective surface, such that a reflection of the polarized light beam at the reflective surface generates an evanescent field in the vicinity of the specimen array; and

a mount or frame coupled to the optical element and having a locating portion engageable with a mating locating element of ~~[[the]]~~ a two-dimensional array detector adapted for providing an image based on spatially distributed polarization changes in the light beam, said mount or frame being operable to locate at least a selected portion of the specimen array in the evanescent field.

15. (previously presented) The cassette of claim 14, wherein said reflective surface comprises the upper surface of a transparent slide, said slide having a lower surface, said lower surface comprising at least one grating and said upper surface including an array of receptors thereon.

16. (previously presented) The cassette of claim 15, wherein said at least one grating comprises a first grating positioned to intercept said polarized light beam from said light source and a second grating positioned to intercept said light beam after it has reflected from said upper surface.

17. (previously presented) The apparatus of claim 14, wherein said cassette and said light source are configured for a single reflection of the light beam at the reflective surface.

18. (previously presented) The apparatus of claim 14, further comprising a flow cell secured to said reflective surface, said flow cell including an inlet port and an outlet port for flowing analyte across said specimen array.

19. (previously presented) The apparatus of claim 15, wherein the at least one grating comprises an electrically alterable grating.

20. (previously presented) An apparatus for imaging, comprising:

a light source emitting a polarized light beam;

an optical assembly including a reflective surface adapted to allow placing thereon a specimen array and a surface having grating portions, the optical assembly being placed to cause the light beam to pass through a first grating portion to direct the light beam to the reflective surface where the light beam is reflected, the specimen array being within an evanescent field associated with the reflection at the reflective surface, and the light beam after said reflection passing through a second grating portion; and

a polarization-sensitive imaging detector, said detector detecting the light beam reflected from the reflective surface including the spatially distributed polarization changes caused by the specimen array.

21. (previously presented) The apparatus of claim 20, wherein the light source and the imaging detector are constructed as a first separate assembly defining a processing assembly, and the optical assembly is constructed as a second separate assembly defining a cassette, the cassette being removably coupled to the processing assembly.

22. (previously presented) The apparatus of claim 21, wherein the cassette comprises an upper surface defining the reflective surface on which the specimen array is placed and a lower surface having the first grating portion and the second grating portion, each grating portion positioned so that the light beam from the processing assembly will pass through the first grating portion into the optical assembly and after reflection will pass through the second grating portion prior to exiting the optical assembly.

23. (previously presented) The apparatus of claim 21, wherein the cassette has a mount or frame portion to which the optical assembly is attached and the mount or frame portion has mating portions and the processing assembly has mating receiving portions such that by matingly coupling the mating portions to the mating receiving portions the cassette is removably coupled to the processing assembly.

24. (previously presented) The apparatus of claim 21, further comprising at least one electronically alterable grating and controllable electronics altering means for electronically controlling at least one grating whereby the angle of the light beam exiting from the at least one electronically alterable grating may be varied.

25. (previously presented) The apparatus of claim 21, wherein the light source in the processing assembly may be changed by an arcuate adjusting mechanism to be directed at selected different angles toward the optical assembly to alter the angle of the light beam into the optical assembly.

26. (previously presented) The apparatus of claim 21, wherein said light source and said processing assembly are movable in relation to each other to enable selecting portions of the specimen array to be sequentially imaged.

27. (previously presented) An imaging apparatus, comprising:
an optical portion defined by an optical member or assembly of members;
a first grating portion at a surface of the optical portion through which a light beam is directed into the optical portion, the first grating portion being configured to direct the light beam through the optical portion to a reflective surface thereby providing an evanescent field, such that, when a specimen array is placed within the evanescent field, spatially distributed polarization changes in the cross-section of the light beam result;
a second grating portion at a surface of the optical portion, the second grating portion being configured for the light beam to exit the optical portion through the second grating portion; and
a two-dimensional array detector, said detector resolving the light beam to provide an image based on the spatially distributed polarization changes.
28. (canceled)
29. (previously presented) The apparatus of claim 27 in which the light beam exits the optical portion after a single reflection at the reflective surface.
30. (previously presented) The apparatus of claim 27, wherein the light beam is polarized prior to entering the optical portion.
31. (previously presented) The apparatus of claim 30, wherein the polarized light beam has a first coherent length and the optical portion has a first distance between the first grating portion and the reflective surface and a second distance between the reflective surface and the second grating portion, said first and second distances each being smaller than said first coherent length.
32. (previously presented) An imaging apparatus, comprising:
a light source assembly for directing a polarized light beam having a first coherent length at a reflective surface in a manner to generate an evanescent field at said reflective surface, such that when a specimen array is placed within the evanescent field, spatially distributed polarization changes in the cross-section of the light beam result;
an optical assembly having a bottom surface spaced apart from said reflective surface a distance smaller than said first coherent length, said bottom surface including first and second grating portions, said grating portions being located and configured to direct light

from said source to said reflective surface through the first grating portion and to direct light reflected from said reflective surface through said second grating portion; and

a two-dimensional array detector, said detector resolving the light beam to provide an image based on the spatially distributed polarization changes.

33. (previously presented) The apparatus of claim 32, wherein said first and second gratings comprise Bragg gratings.

34. (previously presented) The apparatus of claim 32, wherein said gratings comprise electrically alterable gratings, said apparatus also including means for altering said gratings in a manner to change the direction of light incident thereto.

35. (previously presented) The apparatus of claim 34, wherein said gratings comprise electrically alterable holograms.

36. (previously presented) The apparatus of claim 32, further comprising a wavelength filter for selecting the wavelength of light from said light source assembly.

37. (previously presented) The apparatus of claim 32, further comprising an arcuate adjusting mechanism for moving said light source assembly about an arcuate path to selected positions therealong to alter the angle of the light into the optical assembly.

38. (previously presented) The apparatus of claim 32, further comprising a flow cell secured to said reflective surface, said flow cell including an inlet port and an outlet port for flowing analyte across said reflective surface.

39. (previously presented) The apparatus of claim 32, further comprising a computer, said computer including means for converting images from said reflected light into analytical data.

40. (previously presented) The apparatus of claim 36, wherein said wavelength filter comprises a filter wheel located to intercept light from said light source assembly, said apparatus including means for rotating said wheel.

41. (previously presented) The apparatus of claim 36, wherein said wavelength filter comprises a stack filter.

42. (previously presented) The apparatus of claim 34, further comprising ~~also including~~ a plurality of imagers, each of said imagers being located at a position to capture an image generated in response to input light at a corresponding angle of incidence.

43. (previously presented) The apparatus of claim 36, further comprising a plurality of imagers, each of said imagers being located at a position to capture an image generated in response to input light of a corresponding wavelength.

44. (previously presented) The apparatus of claim 38, wherein said flow cell includes means for securing a slide thereto.

45. (canceled)

46. (canceled)

47. (canceled)

48. (previously presented) The apparatus of Claim 1, wherein the light beam undergoes total internal reflection at the top surface.